CHIEF OF ENGINEERS
ENVIRONMENTAL ADVISORY BOARD
WASHINGTON, D.C. 20314-1000 (CECW-P)

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12/7

Mr. Steven Stockton
Director of Civil Works
Headquarters, US Army Corps of Engineers
441 G Street NW
Washington, DC 20314-1000

Dear Mr. Stockton,

This letter is a follow-up to the Environmental Advisory Board's (EAB) recent tour of the lower Missouri River following the 2011 flood event. The EAB thanks the Northwest Division, the Omaha District, and the Kansas City District staff for their hospitality and for arranging this site visit. We also appreciate Brigadier General McMahon taking the opportunity to call into our meeting to share his thoughts on this extreme flood event and his strong support for the USACE's environmental operating principles which the EAB was instrumental in creating.

The focus of the EAB tour and meeting was to review the USACE's operations and to consider if they might be altered to provide additional environmental and ecosystem restoration benefits without detracting from their main purposes. The timing of the meeting following the 2011 flood was coincidental, but provided the EAB with additional insights. Unfortunately, with floodwater just receding at the time of our site visit, an overall evaluation of the flood and recovery measures was not available to us. Some EAB members had recently visited the lowermost Mississippi River and had the opportunity to consider the management of the 2011 flood experienced downriver. While the dedication and commitment of Corps staff are common features of both flood-fight efforts, the EAB recognize that the 2011 flood on the Missouri was a separate event from the flood on the Mississippi.

The EAB was briefed on the Missouri River system and the USACE's responsibilities within the basin, the Missouri River Recovery Program, the use of adaptive management within the basin, the Missouri River Ecosystem Restoration Plan, and the National Research Council's study and related water quality and sediment issues. We made site visits to Council Bend to discuss shallow water habitat restoration efforts and the fish hatchery near Yankton, SD to examine the pallid sturgeon stocking program. We also flew over the basin from Hamburg to Gavin's Point Dam and the Lewis and Clark Reservoir. The flight was very helpful for us to grasp the magnitude of the flood and the flood-related challenges, particularly relating to sediment, facing the residents of the basin and the USACE.

During our visit and in associated board discussions, we identified six significant issues we wish to bring to your attention: climate variability and change, levee setbacks, sediment management, water quality, adaptive management, and public involvement.

Climate Variability and Change: Climate of the Great Plains and Rocky Mountains that are part of the Missouri River Basin is known to be highly variable. That is, on a decade-long basis we know that yearly averages change from wetter to drier conditions, and extreme events occur at irregular intervals. Scientific data now suggest that superimposed on this decadal variation, there may be climate changes on longer timescales. We may be entering a drier period with more extreme floods, but the research is not yet conclusive. Any decisions regarding environmental restoration and basin management should take the possibility of long-term climate change into account in basin-wide planning.

Levee Setbacks: The 2011 flood event was extreme, overshadowing previous flooding within the basin. The key question arising from the flood is whether it is an outlier or the new norm as outlined in the previous paragraph. If the 2011 is an outlier, a flood of similar magnitude has a low annual probability of occurring, and existing flood control measures and structures, when repaired, should minimize flood risk. If, however, very large floods are likely to be more probable each year, other options should be considered. The one most discussed during our visit to the basin was to move some of the levees further away from the river. Doing so would provide more room for the river to accomodate flood water. This approach would also provide greater ecosystem restoration flexibility, both for shallow water habitat needed by pallid sturgeon and emergent sandbar habitat for the least tern and piping plover. Now may be an opportune time to evaluate the options for levee setbacks because some construction will be needed anyway to repair levee breaches, and because with the recent flood experience in mind, many land owners are more receptive to buyouts and easements needed to promote ecosystem improvements.

Sediment Management: Sediment in the Missouri River system is nearly as important as water in terms of environmental restoration. The construction of shallow water and sandbar habitat by the USACE shows how some habitat can be restored. However, the 2011 flood created more shallow water and sandbar habitat than the entire restoration had constructed prior to the flood. The lesson is that in some cases, periodic floods can be helpful for restoration. The trick will be to find the magnitude and duration of flood that is large enough to construct habitat but not so large as to be destructive of protected properties. Any adjustments made in levee position, as described above, should consider the risk of flooding from weather/climate as well as flows designated for sediment management purposes.

Sediment management also touches on management of the mainstem dams on the Missouri. These structures trap most of the sediment flowing through the system at and above Yankton, South Dakota, so that restoration of shallow water and sandbar habitat must depend on sediment presently in the channel – a supply that will not last indefinitely. Lewis and Clark Lake, the reservoir behind Gavin's Point Dam, is already about one quarter filled with sediment, so that sedimentation upstream and sediment starvation downstream are mirror images of the same issue. We conclude that exploration of methods for transporting sediment from Lewis and Clark Lake and emptying such sediment into the channel downstream from the dam is highly warranted. The studies of flow releases necessary to mobilize sediment currently being conducted under the Lewis and Clark Lake Sediment Management Study show promise and should be extended to consider the fate of any remobilized sediment downstream of Gavin's Point Dam.

Water Quality: Because of EPA regulations, sediment is thought of as a pollutant in rivers, even though sediment is a primary component in constructing restored habitat. We found that the USACE has been successful in reaching agreement with its federal partners regarding sediment and nutrient loadings in the middle and lower river. Unfortunately, there are continuing disagreements between federal agencies and state regulatory agencies in Missouri. This latter issue requires additional negotiations that we perceive will be difficult but necessary. We would urge the Corps, however, to maintain the view that sediment is an asset in these systems and its management is crucial to the future of this ecosystem.

Adaptive Management: District USACE managers and planners have undertaken an aggressive program to introduce more effective adaptive management into the restoration process for the Missouri River. We found that they had sent representatives to successful large-scale restoration efforts in the Everglades and the Lower Colorado to learn how others incorporated adaptive management into their efforts. The Corps districts dealing with the Missouri River are creating plans that incorporate an active adaptive management approach that is likely to effectively guide the Missouri River restoration.

Public Involvement: Stakeholders are participating in an important organization, the Missouri River Restoration Implementation Committee (MRRIC). This committee is in the process of identifying how it will fruitfully work with the USACE, and though there may be some challenging discussions ahead, we find that MRRIC is an effective method of involving stakeholders in the restoration of the river. We hope that the committee and the Corps will work closely together to develop recommendations to guide the MRERP and MRRRP.

The site visit to the Missouri River was highly valuable and it provided EAB members with a greater appreciation of the 2011 flood and the challenges **and opportunities** it presents. The EAB recognizes that the control structures are authorized for flood risk management and this must remain the highest priority. However, we believe that some changes in system operation could result in increased ecosystem benefits. We believe that the USACE is moving in the right direction in addressing ecosystem restoration in the Missouri River Basin. Developing a comprehensive floodplain management plan to better integrate the various uses of the river and floodplain could prove beneficial.

Sincerely,

James E. Kundell
Chairman
Chief of Engineers Environmental Advisory Board

cc: MG Temple